

Ethnomatematics of South Bengkulu in Mathematical Learning Community

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ABSTRACT

The purpose of this study was to Determine the implications of the results of this study on learning mathematics. The research of data were Obtained from observations, interviews with traditional South Bengkulu cake sellers, and interviews with mathematics teachers. The results Showed that various research activities Showed that the elements of mathematics in cultured activities could be implicated in mathematics learning items, namely looking for Certain patterns to Determine the elements in the circle and activities by using cultured Contexts students could find concepts in finding the circle area circle. Students' activities in finding concepts can develop critical and creative thinking and can improve the character of love in the local culture. So that teaching materials using cultural Contexts can be practiced and developed in mathematics learning in junior high schools (SMP) in the 2013 curriculum. This study produces a mathematical syntax with ethnomatematics learning approach.

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1. INTRODUCTION

Education is a series of activities that foster the potential that exists in students both physically and spiritually. According Rosa & Orey (2011) important change in mathematical instruction needs to take place in order to accommodate continuous and ongoing change in the demographics of students in mathematics classrooms.

Haji (2017) Mathematics is one of the important subjects taught in basic education up to secondary education. Education is very important so we need a bridge to link it into learning. Education and culture are two things that are closely related to human life, because culture is a fundamental requirement for every individual in society. Rosa and Orey (2003) stated that the mathema develops the tics within the context of ethnos because it consists of daily problems people face, larger problems of humanity, and endeavors of humans to create a meaningful world. So that, required education where learning systems related to culture. Ethnomatematics is one lesson that can be developed, especially in mathematics, and in each ethnomatematics can be used as material for students to understand by conducting themselves of how to measure and discover mathematical concepts.

The guidelines of the National Council of Teacher of Mathematics (NCTM, 1991) highlighted the importance of building connections between mathematics and students' personal lives and cultures. Ethnomatematics is an approach that can be used to explain the reality of the relationship between cultural environment and math as a grove of science (Putri, 2017: 23), while according Marsigit in Richardo, (2016: 120) Ethnomatematics is a science that is used to understand how mathematics is adapted from a

culture and serves to express the relationship between culture and mathematics.

The term ethnomatematics was coined by D'Ambrosio (1985) to describe the mathematical practices of identifiable cultural groups and may be regarded as the study of mathematical ideas found in any culture. D'Ambrosio (1990: 81) defined ethnomatematics in the following way:

The prefix ethno is today accepted as a very broad term that refers to the social- cultural context and therefore includes language, jargon, and codes of behavior, myths, and symbols. The derivation of mathema is difficult, but tends to mean to explain, to know, to understand, and to do activities such as ciphering, measuring, classifying, inferring, and modeling. The suffix tics is derived from techné, and has the same root as technique.

Ethnomatematics object can include traditional games, traditional crafts, artifact and activity (action) embodied culture. Culture-based learning is divided into three things: learn about the culture, learn the culture and learn through the culture. Should pay attention to culture-based learning (Nugroho, 2018: 197) : (1) The substance and competence fields of science / field of study; (2) the significance and the learning process; (3) Assessment of learning outcomes; (4) The role of culture. In other words, ethno refers to members of a group within a cultural environment identified by their cultural traditions, codes, symbols, myths, and specific ways used to reason and to infer (Rosa & Orey, 2007).

Observations made in MTs Makrifatul Ilimi South Bengkulu indicate that there has been no teacher in the learning that

integrates the local culture-based math learning. It is evident from the observations of the lack of learning tools that can stimulate increased mathematical connection, character student's love of local culture and process skills. Student activity in the learning process in the classroom is still very less (Hidayati, 2017; Fonna, 2018a; Mursalin, 2014). In the curriculum of 2013 mathematics learning should be started with the introduction of the problem according to the situation (contextual problem).

Learning that takes place does not stimulate increased character of students especially love the character of the local culture. It can be seen that the character of students in MTs Makrifatul IImi still low where the average character as much as 46.15% of each class there are students who sleep during school hours; 23.07% often go in and out of class and 38.46% of the number of students in class is not polite to the teachers. The results of these observations based on existing black book in school, complaints from teachers who teach in class and parents who see their children's behavior changed. This is caused because their parents pay less attention to their children such as children orphaned by divorce and children who have been orphaned lack of attention and affection of his parents so they vent their frustration in school and influence the behavior of learners others. Based on the character of the students, then it can affect learning outcomes and learner activity. Where to attainment of mastery learning is still below the minimum criteria of completeness is 70, in other words the study of students MTs Makrifatul IImi South Bengkulu is still relatively low. complaints from teachers who teach in class and parents who see their children's behavior changed. This is caused because their parents pay less attention to their children such as children orphaned by divorce and children who have been orphaned lack of attention and affection of his parents so they vent their frustration in school and influence the behavior of learners others.

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The results of the research study by Ricardo (2016) states as follows: (1) Ethnomathematics facilitate learners to be able to construct a mathematical concept with prior knowledge they already know because through the environment of the learners themselves; (2) Ethnomathematics provide learning environments that create a good motivation and fun and free of the notion that math is daunting; (3) Ethnomathematics able to provide affective competencies in the form of a sense of respect, nationalism and pride for relics of tradition, art and culture bangs; and (4) Ethnomathematics support capabilities - the ability of students to the expectations of the implementation of the scientific approach.

Based on the above exposure, the researchers tried to conduct a study entitled "Public Ethnomathematics South Bengkulu in Learning Mathematics".

Based on the background that has been stated above, then permasalahan this study is: How does the application Ethnomathematics south of Bengkulu community in the learning of mathematics?

Based on the formulation of the problem is there, then the purpose of this study are: To investigate the application of community Ethnomathematics Bengkulu Implementation south in mathematics.

2. RESEARCH METHOD

The study aims to determine the community Ethnomathematics South Bengkulu in mathematics. This type of research digunakan in this study is a qualitative approach.

Qualitative research aims to understand the phenomenon experienced by the subject of the study such as behavior, perception, motivation, and on and act holistically by using various natural methods. Researchers digging through the literature, observation and interviews with informants are people who know the culture of South Bengkulu and mathematics teachers from the MTs Makrifatul IImi.

Data analysis is done through a qualitative approach. Data obtained from observation, interview, documentation and analysis of focus group discussions conducted simultaneously by first sorting similar data is then performed data reduction, presentation and conclusion and verification.

3. RESULT AND DISCUSSION

3.1 Tat cake

1. Understanding Cake Tat

Tat cake is a kind of South Bengkulu society cakes, cake tat is usually often served when there are big events such as weddings and custom events. Tat cake is also often used by the - by if there are visitors who come from other areas, they must buy this cake as a by - by of South Bengkulu.

2. Cake type Tat

This type of cake tat there are two Bai Tat tat and children.

3. Ingredients - Baking Ingredients Tat

1 Cupthick coconut milk

2 Cupgranulated sugar can be reduced slightly if too sweet

2 Human Resourcesfull margarine

- 1 Human Resourcesbaking soda
- 1/2 Tspessen bananas
- 1 Itemegg
- Pineapple jam for the filling
- sufficientlyWheat flour

4. Cake Making way Tat

Step - Step Making Cakes Tat which is as follows:

- a) Mix coconut milk and sugar cooked to a boil and then turn off the heat add the margarine, stir, and let stand overnight or wait until it really cold.
- b) Once cool, add the egg mix, add baking soda and then stir banana essen
- c) For two liquid dough, put in a bowl and dough that one aside. Give the flour little by little dough in a bowl that was stir with their hands until they can be distinguished half-smooth texture is enough, the dough will still be sticky but not any just rub hands degan wheat each will form a dough.
- d) Take the dough 40 gram round it off, then drop and stacking diloyang which has been spread with margarine. Flatten dough slightly concave shape in the middle and give the pineapple jam. The shape of the rim motif using nastar flops, flops smeared with flour first let me not sticky. Repeat until all the dough is finished.
- e) Once completed, grilled over medium heat for 25 minutes or until the pastry surface looks dry to the touch, lift cake diloyang let sit and then remove it while still warm place on a cooling rack, after cold plastic containers dlm.
- f) Tips for cake soft and gentle: - the dough is still sticky or mushy just a little, not too much flour dough will be hard and will break when formed. - do not be too long because after a cold baking the cake will be tough.

5. Mathematical value contained in Tat Cakes

In the making of traditional cakes typical Manna, South Bengkulu used as hereditary as a characteristic that is a cake tat circular, which contains aspects - aspects Ethnomathematics associated with the elements - elements that are on the circle, such as the diameter line, finger - the finger, the center of the circle, bowstring, and can load circle concept in the search for a wide circle. Additionally cake praga tool tat can be used as a problem in the context of learning fractions.



Figure 1. Cake tat South Bengkulu

Can be seen in the image above can dihat carving - carving that can be used as Ethnomathematics on math learning to recognize the elements - elements on the circle.

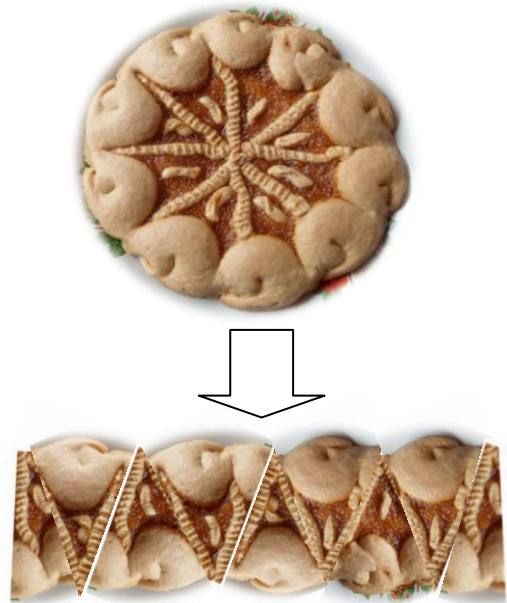


Figure 2. Build using the concept of culture.

It turned out that the results of the pieces - pieces of pie are placed side by side to form a rectangle that resembles a wake. If the pie - pie from different parts of the cake tat has a central angle smaller then wake that occur very close to a rectangular shape. This is a culture that can build mathematical concepts determining the extent in the circle.

3.2 Bamboo Sprout

1. understanding shoots

Shoots are processed foodstuffs from bamboo children are often used as goulash South Bengkulu society.

2. Stew kind Shoots

Shoots consists of two types of bamboo shoots and bamboo shoots sour sweet.

3. Ingredients to make curry Shoots

Here is a child of processed bamboo to be used as food ingredients, namely:

- a) Salt
- b) Bamboo Kids
- c) Water

4. Processed Production Method Stew Shoots

Making way Shoots Sweet namely:

- a) Diiiris bamboo child already thin - thin in a circle boiled until tender.
- b) Then after cooking can be drained and can be processed into goulash.

Sour Bamboo Shoots Making way are:

- a) Kids who are a little hard bamboo is cut into a rectangle.
- b) Then soaked with water and a little salt dikasihkan, mute for 2 days so that children bambuya soft and can be used as processed goulash.

5. Value - contained a mathematical value of Bamboo Shoots

Shoots appeared to have a cone shape when processed into a curry then resembles a circle and a rectangle. Shoots to form a circle usually used as vegetable material and is named after sweet bamboo shoots bamboo shoots while the rectangular shape is a kind of sour bamboo shoots.



Figure 3. Bamboo Sprout

If applied in the study of mathematics in determining the circle that is repung cut thin - as thin as follows:



Figure 4. Examples of shoots to be cut so as to form a circle.

Then the shoots that have been cut circular circumference is measured. This is the concept of calculating the circumference of a circle. The circle is a collection of dots that form a closed arch where the points on the arch are equidistant to a particular point in the arch (Blackwell et al, 2001; Coombe, 2002; Nicol, 2002). The particular point in the arch is called the center of the circle and that distance is called the radius of the circle (Metha, 2014, p.20).



Figure 5. Finding the circumference of a circle concept

By using bamboo shoots can be used as teaching material for mathematics, and students are also more familiar with the culture in the region. In the event that learners can learn mengkontruksikan comprehensive understanding of the concept of the circle and the circumference of a circle to dikreasikan shape based on creativity of students. Starting from simple things like the circumference of the circle ($\pi r d$) and the circle area formula (πr^2 to other more complex circle principles that will be studied at higher levels (Herbst, 2006).

Culture-based learning becomes a method for students to transform the results of their observations on the form and the creative principles of science. Scientific Learning with Ethnomathematics is learning that guides students to observe, ask, gather information, process information and communicate the results of observations about the broad concept of the circle and the circumference of the circle assisted with activities based on the cultural context around.

From the above it can be concluded that pengimplikasian results of this study in mathematics can be attributed to a learning approach scientific because by learning scientific, learners can observe, ask, gather information, process information, and communicate the results of observations of mathematical concepts aided by activities student ever did. According Borba (1993) An etnomathematical curriculum brings a broader understanding about the importance of mathematics to pedagogical activities developed in the mathematics classrooms. This is in line with D'Ambrosio (Fujiati & Mastur, 2014: 175), Ethnomathematics based learning is a mathematician who diperaktekan among cultural groups identified as national tribal communities, labor groups, children - children of a certain age groups and expert groups.

4. CONCLUSION

Based on the research that the elements of mathematics in cultured activities that could be implicated in the study of mathematics that is looking for a specific pattern to determine the elements - elements of the circle, from the activity using cultured context students may find the concept in the search for a wide circle and the circumference of the circles.

Activities - activities of students in discovering the concept to develop critical and creative thinking and enables high character in love with the local culture.

Suggestion

In the Age and technological progress should educators can take advantage of a variety of learning models based Ethnomathematics use to support teaching and learning.

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